

## **Some Considerations for Demographic Assessment of Developing Countries**

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### **I. INTRODUCTION**

The need for a serious consideration of demographic phenomena and the global concern for a systematic and continuous assessment of population dynamics was stimulated by the growing momentum of population growth, especially in the developing countries. Awareness of the imperativeness of demographic assessment began to grow when efforts for social and economic development were systematically initiated in the developing countries. The process of demographic assessment requires availability of data about different aspects of population, in particular, size, age-sex distribution and geographical distribution not only at a given point of time but also at different points of time. Data are also needed on births and deaths in the population. The basic and most important concern is with assessing the base population along with its necessary characteristics, and with working out the basic demographic parameters of fertility and mortality. Collection of data, estimation of basic parameters, and analytical efforts for an understanding of the role of socio-economic and demographic variables are all a part of demographic assessment.

### **Demographic Concern in Developing Countries**

In some of the developing countries, some form of demographic data collection has been in existence for more than a hundred years. Pakistan, India and Bangladesh belong to this category of the developing countries. Among the systems of demographic data collection in these countries, population census-taking has been more or less a regular decennial feature, the results of which usually appear in the form of tables with some explanation of the background and related features. These censuses, at their barest minimum, yielded the total number of persons enumerated in the country as a whole and in its administrative divisions, with sex and age breakdowns of the population at each level.

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In African countries, especially in those which are located to the south of the Sahara, demographic data collection efforts are relatively of more recent origin. In fact, there are some countries where until recently not even a single national census had been taken [1; 4]. One reason for this delayed demographic activity was that they became independent later than most of the Asian countries.

Besides census, civil registration of vital events has also been conducted for more or less the same time as the census, but this system has been, and continues to be, highly inefficient because of gross inaccuracies in the reporting of vital events. This system, which was expected to yield additions to the existing populations through the occurrence of births, and attritions through the happening of deaths, has been of no practical use in so far as its statistical or demographic utility is concerned. On the other hand, censuses, in spite of their limitations as well as the long intercensal periods of about a decade, have been providing, both individually and in conjunction with other sources of data, a useful basis of demographic assessment and investigations. While there has been little improvement in the existing vital registration system in most of the developing countries, efforts to improve the coverage and quality of censuses have been successful to some extent. In contrast with the civil registration system which has yielded highly inadequate data, censuses have been sources of useful demographic data. One must, however, keep in mind that the quality of census data has varied over time.

The basic and most important objectives of collecting and analysing a country's demographic data are to assess the size of population at different points of time as well as the changes occurring in it. The associated vital information required about a population concerns the distribution of population by geographic and administrative regions, and the distribution of population at both the national and regional levels by sex, age, marital status, educational status and economic activity. A census may additionally collect data such as those relating to the process of redistribution of population both inter-regionally and internationally, housing conditions in different areas, etc.

The first and foremost demographic information required about population relates to the number of persons living in the area under study and the dynamics of the size due to fertility, mortality and migration, the magnitude of each of which is determined by interaction between the initial size and structures of population on the one hand and biological, social, psychological, economic, political, geographic and other related factors, on the other. The logical sequence of priorities for understanding a demographic phenomenon is (i) assessment and regular monitoring of major demographic parameters, and (ii) understanding of the factors and their relative influence, association or interaction which bring about changes in the parameters from time to time.

Depending on the needs of the users, the type and extent of demographic information required have varied from time to time. Thus, countries which have only recently won independence have a different and greater concern for demographic data and of understanding the demographic phenomenon than they had under colonial rule. Another factor which has led to substantially increased awareness of and interest in the understanding of demographic phenomenon is the large momentum of population growth in the less developed regions of the world which calls for increased mobilization of resources for a provision of enlarged capital and other social and economic infrastructure.

National governments everywhere are seeking a regular supply of information about population size, its age-sex structure with variation over time, and other population characteristics to help them in the preparation of development plans and evaluation of developmental efforts for the welfare of their populations.

## II. DATA SOURCES

### Census

In the developing countries, population censuses have been yielding useful demographic data, even though the data of different censuses have usually been of varied quality. Unfortunately the quality and coverage of censuses have not improved over time. Nevertheless, in countries where census-taking is of a recent origin, even the first complete count has been of enormous importance since it made it possible to expose the misleading and speculative nature of the figures provided by different national and/or international agencies. Such countries, however, do not seem to have benefited much from the data-collection techniques followed elsewhere with the result that their present censuses are not much better than the earlier censuses of the developing countries with longer histories of census-taking, except in some respects. Thus their data still remain faulty or inadequate. Some of these limitations may, however, be reduced in future censuses.

In the developing countries that have had a longer experience of census-taking, certain improvements have, over the years, been effected in their population counts. Such improvements have probably occurred in the overall coverage, especially in remote areas because of improved means of communication, better coverage and reporting of females, and better realization by producers and users of census data of the need for demographic information.

### Civil Registration

An understanding of the dynamic aspect of population requires data on the occurrence of births and deaths which, in combination with the information about size and age-sex distribution of population, provides a basis for estimation of fertility

and mortality. The civil registration system, which was expected to provide information about births and deaths taking place during a specific period of time, suffers from gross under-registration and under-reporting in most of the developing countries. The main reasons for this undercoverage is that people are either ignorant or they lack interest in registration. Also, the system of registration itself is generally inefficient. However, there are times when birth and death certificates are needed, e.g. at the time of the admission of a child to school, or, in the case of the latter certificate, at the time of the settlement of property disputes and insurance claims. Although, one may expect that deaths would be better reported than births, since burial places are limited and registration could be relatively easier, such is not always the case, especially in rural areas, where the system is either very loose or impractical. Even in the urban or rural areas where it works, the place of registration is not necessarily located in the vicinity of the graveyard. The people may only feel the necessity of registering a death to meet some legal obligation. For the vital events which are actually recorded, the related information about the age of the mother at birth or age of a person at death is either not recorded or given incorrectly. Thus, in the absence of a meaningful and usable vital registration system in most of the developing countries, it is not possible to work out the basic demographic parameters directly by relating registration data on births and deaths with the census-based data on the size and age-sex distribution of population.

### Sampling Approach

In the absence of usable data from the civil registration system, efforts have been made to estimate the basic demographic parameters by collecting the relevant data through different kinds of sampling techniques, because a smaller representative sample of households can yield a more reliable set of data with the services of only a few trained enumerators. In retrospective sample surveys, for example, questions on the number of births and deaths occurring in a specific period of time can be asked for each selected household along with the questions about the desired information concerning the household members. This was expected to yield crude and age-specific fertility and mortality rates. The questionnaires used in some of the sample surveys and censuses also include questions to elicit information to suit the requirements of the indirect method for an estimation of basic demographic parameters. The use of sample approach, the search for appropriate questions for use in the survey or census, and the efforts to develop new methods for indirect estimation were all aimed at obtaining a closer estimate of the occurrence of vital events, during a specific period of time, in relation to the population. In pursuing the same aim, the approach of simultaneous collection of vital events through a dual system of continuous vital registration and periodic retrospective household surveys in the sample areas, on an independent basis (PGE), was carried out in Pakistan and elsewhere [2; 3]. The major objective of the dual-system approach was to fully detect

the occurrence of births and deaths in the sample areas in order to arrive at improved measures of fertility and mortality.

The Pakistan PGE experiment, which was carried out from 1962 to 1965, was a pioneering exercise in the application of the dual-system approach at the national level [5]. After the termination of this experiment, a single-system Population Growth Survey (PGS) was initiated in 1968 [6]. The main objectives of this approach were to retrospectively collect data on the occurrence of vital events from selected sample areas through periodic surveys, and to arrive at estimates of vital rates by relating the number of vital events to the sampled population.

While, on the one hand, adoption of different types of vital-data-collection methods through a sampling technique led to improved estimates of fertility and mortality, efforts have also been continuously made to bring about improvements in census-taking. The importance of population data, collected on the basis of a complete coverage of all sub-regions of a country, has been increasingly realized by users and producers of data. Although all past censuses, whether of developed countries or of developing countries carry errors and faults, these blemishes seem to be more numerous in the censuses of the less developed countries than in those of the developed countries. Improvements in the coverage, content and response can be made in the census-taking of the less developed countries, but such factors as lack of resources, illiteracy, poor means of communication, cultural traits, climatic conditions, etc., limit the scope of the improvement efforts. Census data, in spite of the errors they carry, have always been, and continue to be, of great importance. Demographic research on census data does help to assess the range of errors in some respects. Much research has, however, been carried out by utilizing different aspects of census statistics in order to arrive at some useful demographic estimates.

In some countries of Africa, the 1950s marked the beginning of a new interest in collecting demographic data through sample surveys [1; 4]. However, in those countries, estimation of vital rates has been much more difficult than in many other countries of the world, for gross inadequacies of resources, equipment and skills, on the one hand, and low educational levels, apathy and ignorance of the general public on the other hand, result in data of poor quality in many respects. Simultaneous with the development of demographic techniques for indirect estimation of fertility and mortality rates, a systematic collection of demographic data was adopted by an increasing number of countries, primarily through census-taking which was aimed not only at enumerating population with age-sex distribution and other socio-economic characteristics, but also eliciting data for an indirect assessment of the dynamics of population. As a result of the national and international efforts since the 1960s, participation in census-taking expanded among African countries, and the 1970 and 1980 rounds of censuses were backed by the greatest investment ever made in the continent, through international technical co-operation for collection

and analysis of demographic and socio-economic data [1]. Thus, for a majority of the countries in Africa, the 1970 round of censuses provided a more comprehensive and detailed breakdown of demographic information. This was true not only of those countries which had conducted their censuses in the previous two decades but also of those which had taken their first ever national census in the 1970s. The latest two rounds of census-taking, viz. those of the 1970s, and the 1980s, provided more detailed information even for the sub-regional levels. Such information, apart from being useful for regional planning, project implementation and evaluation, also provided a useful basis for preparing sampling frames for future demographic and socio-economic surveys.

In addition to the population censuses, a number of demographic and socio-economic household sample surveys have been conducted in the African countries, either intercensally or post-censally. For example, in Somalia, where the first ever census was conducted in 1975, two national sample surveys, one focusing primarily on demographic and related aspects and the other primarily on labour force and related characteristics, were conducted in 1980 and 1982 respectively [7]. Such surveys served the dual purpose of supplying data for independent analysis and supplementing the census information for a better understanding of the demographic factors and related features of the population [1; 7]. Although sample surveys have been useful in providing independent insights into the population dynamics of a country, the census continues to be a major source of demographic and socio-economic information in developing countries, mainly because it provides a comprehensive cross-sectional view of population and its related characteristics for all parts of the country. For African countries, censuses are of even greater importance because these are the main sources of comprehensive demographic information which is required for administrative purposes, development planning, research, etc.

### III. SOME PERSPECTIVES AND CONSIDERATIONS

Demographic assessment of a developing country involves realization and identification of the country's needs in accordance with its stage of socio-economic development, availability of conventional and indirect demographic data sources, and the extent to which demographic analysis and research on the basis of these data have been done both inside the country and elsewhere. In this regard, the countries with a long history of conventional data sources, primarily census, should be taken separately from those countries where census-taking has been a recent phenomenon. Since most of the developing countries have been under colonial rule in the past, their stage of serious concern for availability of demographic information began after their independence, when demographic information was needed for administrative and planning purposes. Demographic information about those countries was also

needed by such international organizations as the United Nations (and its various agencies), the World Bank and the other aid-giving agencies, which were involved in providing different types of assistance to the newly independent countries in order to help them to develop their socio-economic infrastructure. Interest in the development process of such countries proved to be a stimulus for tremendous research and academic advancements in the major aid-giving developed countries, primarily the U.S.A. and some of the European countries. The fact that the population-growth momentum was also building up in many of the newly independent developing countries provided a similar boost to the developed countries and elsewhere to carry out research for development of demographic methodologies, which were suitable for more appropriate utilization of inadequate demographic data. In some of the developing countries where the population size had already become too large, the population-planning programmes were launched with the technical and financial assistance of the population-related organizations in the developed countries. These programmes were subsequently expanded with the financial and technical assistance at the official level. Later, a United Nations Fund for Population Activities was established for the expansion of population-related activities with the United Nations assistance.

In the developing countries, interest in and serious realization of demographic understanding and of the need for action programmes to deal with the population problem was induced among officials as well as students, scholars and researchers, primarily from outside the country.

Because of a general lack of resources and technical manpower, most of the developing countries, after independence, had to depend on foreign expertise for help in conducting censuses or surveys. In countries where some statistical infrastructure already existed, there was only a marginal need for such expertise. However, for developing institutions of demographic research, statisticians and demographers were sent abroad for higher studies and training with the aim of creating the much-needed specialized manpower. Such manpower, along with others, formed the working base for demographic assessment through data collection and research in the country. In some of the African countries the need for foreign expertise was greater than in other countries. This is primarily because of a lack of resources and shortage of experienced statisticians and demographers. For many of such countries the censuses, surveys and their analyses were carried out by experts provided by the United Nations and other international organizations [1].

In the light of the foregoing, there are some important considerations for demographic assessment which need to be highlighted with special reference to the developing nations.

In countries of short demographic experience, the scope of further improvement, through censuses and surveys, in both data collection and demographic assessment is greater than in those countries which have had a long experience. Countries

with a much longer experience of data collection and research have already had opportunities to build up (and refine) demographic information and thus there is little justification for such countries to continue to fiddle with estimates of an *ad hoc* nature. If such countries have failed to reduce the margin of errors in their demographic data, they have only their data-producers and researchers to blame. Countries like Somalia, which are among the least developed, lack the necessary expertise and resources, and because of special geographical, social or ethnic problems have genuine reasons for not being able to independently carry out a census or a national survey, and it would surprise no one if such countries produce faulty data. However, when such countries are helped by the UNO specialists or other international experts, even they can produce as Somalia did in 1975, bench-mark estimates which can be expected to be at least technical, unbiased and consistent, both internally and with other sources. Such systematically collected data in such countries are far better and more reliable than many widely varying figures based on guesses.

In order to get the best out of a survey, the decision-making at the time of planning and each stage of its execution has to be done on the basis of thorough discussions. Such discussions often lead to a choice of better alternatives at different stages of survey taking. However, when it comes to the selection of results from different surveys for official utilization at national level or for taking policy decisions, the acceptance or rejection of the results from any set of data has to be done very carefully. The efforts of research and experiments to explore ways and means for achieving better demographic measures and indices must be encouraged, but, when it comes to the applicability or representativeness, the choice should be made by looking at all aspects of the study and by evaluating its merits and demerits, including reliability and validity in relation to any other existing studies. The choice of results for representativeness must not, in any case, be made in isolation if other independent studies or results are available. It is, however, important that the basis on which a data set or results of research studies can be accepted or rejected should be clearly decided and kept in view.

In the less developed countries, especially in Africa, where demographic sources are limited, extra care and efforts are essential for estimation of demographic parameters which are subsequently to serve as bench-marks. In doing so, the errors of assumptions and methodologies experienced by some other developing countries can at least partly be avoided. It is, however, not practically possible to produce accurate demographic parameters for a country where, for example, only one census or one survey has been carried out. For demographic analysis of only one available source, even if it additionally provides data about births and deaths, one has to make more assumptions, use hypothetical models, examine internal consistency, etc., to work out indirect estimates of fertility and mortality. For this purpose, the age-sex distributions, the information on children ever born and children survived,

the number of births during the preceding 12 months, if collected, can be used as input in a number of recently developed methods to arrive at some estimates of fertility and mortality. In the absence of any other demographic evidence, results from the demographic analysis of a single source can be accepted as the first focus on the demographic situation and hence used for planning purposes. The validity of results can be improved if, in addition to the findings of a census, results from a survey are also available. These can be then complementarily used to bring out more plausible results. Such estimates should not be unbelievably high or low, the criterion for which should be determined on the basis of the long experience of some of the other developing countries. It is very much desirable that known data-inadequacies are clearly stated and methodological errors avoided. It is also important that the demographic estimates should not be conceptually erroneous.

The demographic parameters worked out from initial sources are often used as bench-marks for comparison with future estimates and also with the estimates available from other countries, which may not reflect the true cross-sectional or longitudinal differentials. It is, therefore, essential that such bench-marks be appropriately modified in the light of the evidence from subsequent experience and research.

Aspects on which improvements in data collection through censuses and surveys have been indicated over time and those about which confusion continues to prevail, have to be clearly identified. Such aspects may be peculiar to a specific country or group of countries. It has been observed in Pakistan and elsewhere that different surveys conducted by different agencies around the same time and even those which are repeated with a gap of a year or so, using the same instruments, may give substantially different results. Efforts have to be made by both the data generating agencies as well as the researchers to find how much of such variations are explainable by sampling errors and how much can be attributed to other factors, especially to the quality of enumeration. For example, if different enumerators substitute their own guesses for answers to questions where there is no response by the respondent due to lack of knowledge or interest, then the results are obviously biased. Similarly, there are the so-called data-cleaning exercises, which may smother some of the variations which the researcher wants to look for from the results of the surveys. For analytical research, the user would like to have actual data and not adjusted or cleaned data, since one can be easily misled by such data for which the assumptions for adjustment and cleaning process are unknown. Let such adjustment, if necessary, be left to the demographic analysts and researchers. Sometimes the results yielded by different surveys generated or analysed by same organization are unbelievably consistent or systematic, which may cast serious doubts in the minds of the more careful user about the representativeness of results, and even about the integrity of the data-producers. In this regard the surveys carried out to evaluate some of the action programmes, such as the population planning programmes, have to be carried out very carefully. If these are carried out by the agency

involved in the action programme itself, then the analysis of data should preferably be done as independently as possible.

In this regard, when more than one survey is carried out at one time to provide data which can be used to estimate basic demographic parameters or some other fertility and mortality parameters, it is desirable for those interested to wait for the detailed analysis of the data from these sources before passing any judgement on the reliability and validity of any set of data. It has, however, been observed in some cases that a particular set of data is preferred or condemned without the knowledge or examination of its merits and demerits *vis-à-vis* other sources. In the developing countries, where resources to spend on data collection and analysis are limited, it would be appropriate to make a thorough use of all the data sources, both individually and as complements of other sources, to arrive at more plausible and representative estimates. It has to be kept in view that even though a set of data may have errors or built-in inconsistencies, each data-collection venture provides new opportunities for exploration, understanding and experience. The existence of shortcomings should not be made the basis of a total rejection of a particular set of data, because each set of survey data can be subjected to a variety of methodological investigations leading to better ideas and understanding about problems of data collection or demographic assessment. The main aim of data collection through successive censuses and surveys, as well as of the demographic research carried on them, is to bring into more and more clear focus the demographic situation existing at one time and its dynamics over time. Since the demographic situation in a developing country is always changing, there is a continuous need to reassess the past, evaluate the present and project the future. There is, however, little justification for demographers to overexplore older sets of data at the cost of new sets of data, except to carry out theoretical research or to do analysis for the realignment of the estimates of demographic parameters overtime.

In such developing countries, in which the institution of census is well established and separate organizations exist for this purpose, census-taking has become a specialized job. The basic function of such organizations is to carry out censuses process data and present its results in a tabulated form with some background information. Beyond this, analysis and research on population data are normally done by demographers. But this does not mean that a census organization may not carry out analysis and research on census data. The point which is emphasized here is that supply of basic census results in a published or unpublished form is entirely the responsibility of the census organization. Beyond this is the stage of analysis and research, which may be done by researchers from both outside and inside the census organization. The research aspect of the analysis, especially that which is based on hypothetical models and methodologies involving different kinds of assumptions, are normally produced with the responsibility of the individuals and not of the organizations. Such efforts, if done by the staff of the census organization, should be

separated from the basic results; otherwise the users, especially those who are not demographers, may mix up the validity of the two types of output. In fact, what sometimes happens is that the uninformed user wrongly expects the census officials to provide all types of demographic information. It would, therefore, be appropriate if the responsibility of census organization and the scope of its work are clarified officially.

#### IV. SUMMARY AND CONCLUSIONS

The developing countries, soon after their independence, embarked on planning their social and economic development. For planning and administrative purposes, one of the important requirements was availability of demographic information. Another important factor which contributed to the pressing need for demographic information was the accumulated momentum of population growth which had assumed unprecedented proportions in most of the developing countries.

Out of the two traditional sources of population-related data, viz. the census and the civil registration, only the former source provided some useful demographic data. The data from the civil registration were mostly of no statistical utility. Among the African countries which got their independence more recently, there are some where only one or two censuses have been conducted to date. In view of the non-existence of accurate demographic information in such countries, there was a serious national and international concern, especially in the United Nations and in some of the developed countries, for assisting the developing countries in strengthening the institutions of census-taking and for developing other sources for supplying data relating to the population dynamics of the country, as well as for developing the local potential for demographic analysis.

The overall objective of demographic assessment is a systematic analysis of demographic parameters in order to determine demographic trends and their interactions with the social and economic variables of concern to the policy-maker. Such an analysis has to be based on appropriate statistical data relating to various aspects of the population. The two traditional sources, namely census and vital registration, yield reliable information in the developed countries, and their demographic understanding is less difficult. The non-availability of accurate population-related data in the developing countries from the above-mentioned two sources, plus the fact that the population growth momentum in many of these countries had become unprecedently high, led to efforts not only for improvement in the quality and scope of census, but also for evolving and employing different types of sample approaches as an alternative to civil registration. The non-availability of accurate demographic information in the face of the pressing need for socio-economic development and for

limiting the growth rate of population led to major advancements in developing alternative ways of demographic data collection and techniques for demographic estimation. As a result of the new approaches, a number of data sets and research studies based on such data have been produced for different developing countries.

Among the developing countries there are those which became independent relatively early while some others, especially in Africa, got their independence more recently. Many of the countries which became independent relatively early had a long history of census-taking. Such countries have also made major strides in data collection through alternative sources, after their independence. For this group of countries, which includes Pakistan, India, Bangladesh, etc., a large number of demographic studies based on all types of data have been produced. The other group of countries, where independence and subsequent efforts of demographic data collection and their analysis are a relatively recent phenomenon, the output in both these respects and the experience gained from these are much less in comparison with those of the countries referred to earlier. The main point of emphasis in this paper is that for the countries of the first group, where a number of innovative data sets have been generated and their demographic analyses have been done, the time has come for the demographers of those countries to make research efforts for the assessment and identification of avenues by which substantial success has been achieved in an accurate assessment of the demographic phenomenon. In doing such research, it would be appropriate to identify which of the data-collection efforts, including the census, have yielded relatively accurate sets of data, and in what respects such successes have been more prominent. For all the sets of data it would be essential to identify the factors which limited their reliability as well as scope for further improvements even after a long experience of doing such exercises. For assessing the utility and reliability of a data set it is important to take into consideration the basis and procedures adopted for data cleaning. Similarly, before utilizing the results of any of the research studies it would be appropriate to check the validity of the demographic techniques used in the study. Such an assessment would be very useful, since in the last few years there has been a rapid advancement in the development of new techniques for indirect demographic estimation. One possible way to assess the validity of a technique is to apply it to an accurate set of data from a developed country and find out how the results of such an exercise match those obtained from the direct sources which are expected to be accurate in such countries. It has been suggested that such applications of indirect techniques are not necessary for an evaluation of data, though they are often of interest in evaluating the methodology itself [8]. Having done so much in data collection and analysis, demographers in the developing countries of a relatively long experience should be able to develop a better demographic picture about the present and the past, by carrying out analysis of all the available resources, to produce the best possible estimates of

levels and trends on the basis of which, and by using more realistic assumptions, more plausible estimates could be worked out for the future. The justification of such an exploratory research, which may lead to making appropriate adjustments, revisions and corrections of the already existing estimates, lies not only in the determination of the demographic trends but also in the need to carry out international comparisons. One important consideration in this respect should be the possibility that in different countries the sources of demographic data and the methods used for their estimation may not be the same. Such differences make it difficult to study inter-country differentials, in respect of estimates of a particular parameter.

In training the new generation of demographers, whether it is within the same country or in other less developed countries, it would be extremely useful to share with others the knowledge of the advantages or inadequacies of a particular data-collection approach or of the application of a demographic technique. The sharing of such knowledge may help in reducing the time span for getting a more realistic demographic picture for countries facing similar problems of availability and accuracy of data.

In conclusion, it must be emphasized that both theoretical and practical research on new avenues of exploration is extremely important for the developing countries, but such efforts must not be made at the cost of similar efforts for understanding the basic demographic realities.

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### Comments on “Some Considerations for Demographic Assessment of Developing Countries”

The theme of this paper is well chosen as it is concerned with a problem which is of fundamental importance to economic and social development planning. In a country like Pakistan, where the rate of population growth (around three percent per annum) is among the highest in the world, consideration of demographic factors is of timely and utmost significance. Factors, such as population size, growth, composition and distribution, along with the level of investment, are of crucial importance for plans for raising income levels and living standards. These factors are also major determinants of the extent of employment. In other words, consideration of demographic factors is involved in both capital-oriented and employment-oriented developments plans. Demographic considerations also enter into the determination of levels of consumption, investment and production of goods and services.

On the other hand, socio-economic changes, particularly developments in such sectors as education, health, employment and family planning, influence levels of fertility, mortality and internal and international migrations in various ways. Thus, it is the interaction of demographic, economic and social variables rather than demographic assessment alone which deserves consideration.

The major thrust of the paper is on the appraisal of the demographic situation based on series of data on population size, sex-age composition, geographic distribution, births, deaths and migration. The author considers data collection, estimation of basic parameters and analysis as part of demographic assessment. He has advanced three reasons which have contributed to the awareness for such an assessment:

1. Momentum of population growth in developing countries;
2. Advent of systematic planning for social and economic development; and
3. Political independence.

I wish to offer a few comments to supplement these three reasons.

#### 1. Growing Momentum

The use of the word “momentum” may not appear appropriate to some demographers as more recently this concept is being used to denote the impact of increase in the proportion of females of reproductive age (15-49) on the level of crude birth-rate and the rate of natural increase of population.

An increase in the proportion of female population of reproductive age begins to take place as a result of fertility decline which reduces the proportion of children under 15 years of age. If fertility continues to decline until it reaches the replacement level, population will continue to grow for another 40–45 years before a zero-rate of growth is achieved. It is this built-in potential which is referred to as momentum.

The author in his paper is not referring to that momentum. He is talking about the increase in the rate of growth which began in the developing countries in the Fifties owing to a substantial decline in the level of mortality without any notable decrease in the level of fertility. The decline in the level of mortality occurred as a result of improvements in health and medical facilities. The author has used the concept of "momentum" in this general sense and it does convey the meaning to the general audience. Although there is no etiological plan in the concept, I thought a clarification was necessary.

## 2. Advent of Systematic Planning

I agree with the author that the need for demographic assessment grew with the advent of planning for development. This is the major concern which is being shown by researchers as well as planners and policy makers. The population-development relationships have been well recognized but the approach to consider population variables in the planning process is still in the formative stage. Population is still being considered an exogenous variable and the traditional approach of using population projections in the planning of social sectors, viz. health, education, manpower, housing and family planning, is continuing. However, efforts are continuing to obtain an understanding of the inter-relationship and to integrate demographic variables with the development planning process.

Several economic-demographic models have also been developed but only a few (Bachue-110 and Population Development Model: FAO) treat population as an endogenous variable. However, research is continuing to endogenize demographic variables.

Another problem is the consideration of variables in models which differ from one model to the other. There is no list of agreed variables by the model builders to provide a framework of population – development interrelationship.

A related problem is that the population-development interrelationship involving direct and indirect linkage is highly complex and unless intensive research is undertaken, it makes the identification of variables difficult. Also important in this context are the direction and intensity of the relationship. While attempts to develop highly sophisticated techniques of modelling are continuing, research based on reliable data to develop more refined and precise matrices of variables must also continue.

The author in his paper does not advocate any sophisticated technique for understanding the population-development interrelationship but he argues for the appraisal of demographic trends based on reasonably reliable data and "understanding of interaction with social and economic variables of concern to the policy maker".

## 3. Political Independence

The third reason for the concern of developing countries with demographic assessment mentioned by the author is the political independence.

It appears that after independence, developing countries wanted to undertake censuses to obtain current data to provide base-line information for development planning. More recently it happened in several African countries. In the context of demographic assessment, the author has discussed the conventional sources of population data, viz. population census and vital registration system. He rightly contends that while censuses have significantly improved and are producing useful data for demographic assessment, vital registration systems have not shown any progress in producing usable data in the more developing countries. In the absence of adequate vital registration system, demographic sample surveys have been filling the gap. In this context, he has cited the use of dual system of data collection and of PGE, followed by PGS in Pakistan. He has also mentioned demographic surveys in African countries and in particular in Somalia. Evidently, if all such efforts were progressively improved and continued, gaps in the availability of current reliable data could be filled. Also, if data through such inquiries are carefully collected, efficiently edited, corrected and expeditiously made available, increased consideration will be given to the use of such data in demographic assessment in the context of development planning.

The author has also touched upon techniques of indirect estimation of demographic parameters without being specific and has argued that these techniques should first be applied to the "accurate set of data" of a developed country and the results of this application should be compared with those obtained from direct sources.

Although it is highly desirable to test the validity of a technique, I am afraid the assumptions behind the indirect techniques, such as in the case of stable or quasi-stable model technique (that the level of fertility remained constant and that changes in the level of mortality were systematic and also that population remained closed to migrations) might be difficult to meet particularly in the settings of a developed country. Similarly, for applying the P/F ratio to estimate total fertility rate, the condition that fertility did not change during the past 10–15 years might not be fulfilled in a developed country.

Finally, I must point out that the paper being a narrative and a broad-based presentation, I had some difficulty in fully grasping its contents. The intended

scope of the paper included "developing countries" which are more than 100 in number and are at varying stages of statistical development. However, it specifically mentioned only a few countries such as Pakistan, India, Bangladesh and Somalia or countries South of Sahara, which may not fully represent the developing countries.

It is expected that in revising the paper the author will give consideration to the latest developments in improving the quality of data and in dealing with problems of demographic-development interrelationship.

The wide-ranging issues raised in this paper are potentially important and offer a challenge to both the producer and users to strengthen their efforts relating to the development of demographic data.

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